wherein brightness or chromaticity or both of image(s) output from the display panel is corrected by controlling light emission of the light source according to a measurement value obtained from the at least one sensor.

REMARKS

This is in response to the Office Action dated April 3, 2003. Claims 1-15 are pending. Attached hereto is a marked-up version of the changes made to the claim(s) by the current amendment. The attached page(s) is captioned "Version With Markings To Show Changes Made."

Section 112 Rejection

Claims 1-12 stand rejected under 35 U.S.C. Section 112, first paragraph, for the reasons set forth on page 2 of the Office Action. In particular, the Office Action cites U.S. Patent No. 6,388,648 and contends that change of brightness will lead to unpredictable and possibly unacceptable color shift. This Section 112 rejection is respectfully traversed for at least the following reasons.

The instant specification, including the drawings, clearly teach one of skill in the art how to make and use the instant claimed inventions. Detailed circuitry is illustrated for purposes of example in Figs. 1, 7, and 8. One of skill in the art could have easily made examples of the instant invention based on the disclosure as filed. Potential negative effects of brightness adjustments on color balance are overcome by adjusting the light source based upon screen brightness measured directly by an optical sensor(s) placed on the display panel and/or by controlling the light source based at least on a

measured temperature thereof. Moreover, the entirety of all pending claims is fully supported by the instant application as filed.

The cited '648 Patent teaches directly away from certain embodiments of the instant invention. The '648 Patent teaches that it is *undesirable* to adjust the output of an arc lamp used to illuminate an LCD panel (col. 7, lines 30-35). In contrast with embodiments of the instant invention, the '648 Patent teaches that lamp adjustments should *not* be made, and that the LCD driving signals (which are supplied to the various pixels in the display panel – not to the light source) alone should be used to adjust display output (col. 7, lines 30-40). Just because the '648 Patent teaches away from embodiments of the instant invention does not mean that the instant invention is not enabled or described. If this were the law (which it is not), then most patentable subject matter would be subject to rejection under Section 112, first paragraph; this clearly is not the purposes or function of the statute. The instant specification illustrates in detail (much more detail than necessary) how to make and use examples of the instant inventions.

According to certain embodiments of the instant invention, the backlight is controlled based on the screen brightness measured directly by an optical sensor(s) placed on the liquid crystal panel and/or based on temperature of the backlight (so as to achieve the optimal control of the backlight with consideration given to the influence of color shift). This control of brightness does not have any negative effects on chromaticity of the liquid crystal panel. Thus, in this respect, certain embodiments of the instant invention have no limits of applicability at all. The Section 112 rejection is clearly incorrect, and should be withdrawn.

Claim 10

Claim 10 stands rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Tsuzuki (apparently US 6,388,716) in view of each of Suzuki, Terasaki and Kashiyama. This 4-way Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 10 requires "at least first, second and third separate and distinct optical sensors for measuring how the liquid crystal panel is emitting R (red), G (green), and B (blue) light, respectively, so that *R, G and B light output from the liquid crystal panel is measured independently*; a signal reading circuit for converting measurement values obtained from the optical sensors into a current brightness value of the liquid crystal panel . . . . the brightness of the liquid crystal panel is corrected by controlling light emission of the backlight according to the measurement value obtained from the optical sensors." In other words, Claim 10 requires first, second and third separate and distinct optical sensors for measuring how the liquid crystal panel is emitting R, G and B light, respectively, so that R, G and B light output from the panel is measured *independently*. The cited art fails to disclose or suggest this aspect of claim 10, either taken alone or in the alleged combination.

The Office Action *admits* that Tsuzuki, Suzuki and Terasaki fail to disclose or suggest this aspect of claim 10 (Office Action, pg. 9, lines 1-3). Admitting this failure of the first three references in this respect, the Office Action attempts to rely upon the newly cited Kashiyama reference. However, Kashiyama also fails to disclose or suggest this aspect of claim 10. In particular, the RGB sensor 311 in Fig. 22 of Kashiyama which

measures R, G and B light is measuring incoming "photographing light" which passes through plate 312 – NOT light emitted from display 308. Kashiyama's sensor 311 is entirely unrelated to display 308, and does not measure any output thereof.

Thus, it can be seen that no cited reference discloses or suggests separately measuring R, G and B light output from an LCD in order to control the backlight thereof as required by claim 10. Even if the cited references were combined as alleged in the Office Action (which applicant believes would be incorrect in any event), the invention of claim 10 still would not be met.

Claims 1 and 12

Claim 1 requires "at least one optical sensor for measuring how the liquid crystal panel is emitting R (red), G (green), and B (blue) light, wherein the R, G and B light emitted by the liquid crystal panel are measured independently from one another by the at least one optical sensor." As explained above, no cited reference discloses or suggests separately measuring R, G and B light output from an LCD in order to control the backlight thereof as required by claim 1. The cited art is entirely devoid of this feature.

Claim 12 requires "at least one sensor for measuring how red (R), green (G) and blue (B) light is emitted from the display panel, wherein R, G and B light emitted from the display panel are measured by the at least one sensor independently from one another." As explained above, no cited reference discloses or suggests separately measuring R, G and B light output from an LCD in order to control the backlight thereof as required by claim 12 in this respect.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. (*Amended*) An image display device, comprising:

a liquid crystal panel for displaying an image including RGB colors;

a light source for emitting light toward the liquid crystal panel that the liquid crystal panel receives and uses for display operation thereof; and

[an]at least one optical sensor for measuring how the liquid crystal panel is emitting R (red), G (green), and B (blue) light, wherein the R, G and B light emitted by the liquid crystal panel are measured independently from one another by the at least one optical sensor;

a temperature sensor and a lamp temperature circuit for determining a temperature of the light source;

wherein light emission of the light source is controlled according to a measurement value obtained from the at least one optical sensor in order to correct brightness or chromaticity or both of the liquid crystal panel, and also based upon the temperature of the light source as determined by the temperature sensor and the lamp temperature circuit.

10. (*Unamended*) An image display device comprising:

a liquid crystal panel for displaying an image;

a backlight for illuminating the liquid crystal panel from behind;

at least first, second and third separate and distinct optical sensors for measuring how the liquid crystal panel is emitting R (red), G (green), and B (blue) light, respectively, so that R, G and B light output from the liquid crystal panel is measured independently;

a signal reading circuit for converting measurement values obtained from the optical sensors into a current brightness value of the liquid crystal panel;

a brightness setting circuit for permitting entry of specified brightness of the liquid crystal panel;

a converting circuit for converting an output of the brightness setting circuit into a specified brightness value of the liquid crystal panel;

a calculator for calculating a difference between the current brightness value and the specified brightness value of the liquid crystal panel;

a duty factor setting circuit for outputting a pulse signal whose duty factor depends on an output of the calculator; and

an inverter for producing a driving voltage and a driving current for the backlight according to the pulse signal,

wherein the brightness of the liquid crystal panel is corrected by controlling light emission of the backlight according to the measurement value obtained from the optical sensors.

12. (*Amended*) An image processing device including a display panel and a light source that emits light that is received and used by the display panel to produce an image, comprising:

at least one sensor for measuring how red (R), green (G) and blue(B) light is emitted from the display panel, wherein R, G and B light emitted from the display panel are measured by the at least one sensor independently from one another;

wherein brightness or chromaticity or both of image(s) output from the display panel is corrected by controlling light emission of the light source according to a measurement value obtained from the at least one sensor[, and also in accordance with a measured temperature of the light source].